DOCUMENT RESUME

ED 355 981 JC 930 148

TITLE	ATIP: Automotive Technician Internship Program.
INSTITUTION	De Anza Coll., Cupertino, Calif.
SPONS AGENCY	Automotive Service Councils of California.; California Community Colleges, Sacramento. Office of the Chancellor.
PUB DATE	92
CONTRACT	90-0463
NOTE	79p.
AVAILABLE FROM	Occupational Training Institute, 1765 Scott Blvd., Suite #210, Santa Clara, CA 95050 ($6).
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Associate Degrees; *Auto Mechanics; Community Colleges; *Cooperative Education; Course Content; *Course Descriptions; Equal Education; *Internship Programs; Job Skills; Outcomes of Education; Postsecondary Education; Program Evaluation; *School Business Relationship; Two Year Colleges; Vocational Education; *Work Experience Programs

ABSTRACT

The Automotive Technology Department (ATD) of De Anza College (DAC) in Cupertino, California, in partnership with the Automotive Service Council of California, received funding to develop and implement a 2-year, competency-based certification program for automotive service technicians. Students in the Automotive Technician Internship Program (ATIP) receive paid training at non-union shops as part of a classroom/laboratory training internship. During the 2 years of the program, students are provided with 2 days a week of full-time classes, a minimum of 3 days a week paid internship with a participating independent auto repair shop, and full-time employment during the summer. Through the cooperation of the Occupational Training Institute at DAC, Private Industry Councils in the local area, and the Department of Social Services, specialized recruitment was undertaken to encourage disadvantaged, minority, and women to participate in the project. Students in the ATIP begin internship employment at $6/hour and receive pay increases of $.75/hour with each program module completed, reaching $12.75/hour at completion of the Associate of Arts degree. Of the 26 students who started the ATIP program, a total of 10 graduated in 1992, 6 students dropped-out, and 9 students are continuing the program in 1992-93. Poor economic conditions, resulting in a decrease in the number of participating shops, did not allow for a new group of students to begin the ATIP program in fall 1992. A project budget analysis with data tables, a review ATD course offerings and certificate options, detailed course outlines for 10 ATIP courses, sample internship agreements, and promotional materials are included. (PAA)

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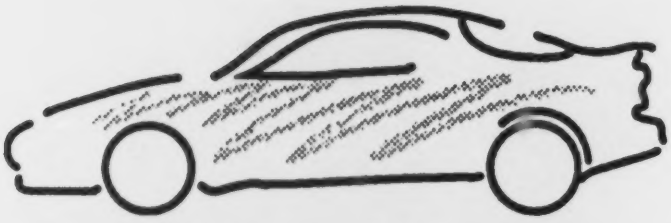

A T I P

Automotive Technician Internship Program

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JC930148

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CALIFORNIA COMMUNITY COLLEGES
VOCATIONAL EDUCATION SPECIAL PROJECT
TITLE III A - CBO
1991-1992

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AUTOMOTIVE TECHNICIAN INTERNSHIP PROJECT

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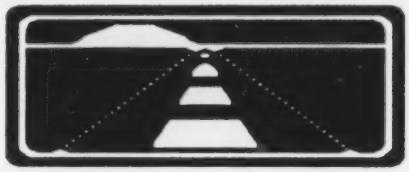

ATIP

Automotive Technician Internship Program

1991-92

THIS REPORT IS MADE PURSUANT TO CONTRACT AGREEMENT #90-0463. THIS PROJECT WAS SUPPORTED BY THE CARL D. PERKINS VOCATIONAL EDUCATION ACT , TITLE III A-CBO, P.L. 98-524, FUNDS ADMINISTERED BY THE CHANCELLOR'S OFFICE, CALIFORNIA COMMUNITY COLLEGES.

" Automotive Technician Internship Program which is the subject of this report was supported in whole or in part by the U.S. Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education, and no official endorsement by the U.S. Department of Education should be inferred".

AUTOMOTIVE TECHNICIAN INTERNSHIP PROGRAM

De Anza College's Automotive Technology Department in partnership with the Automotive Service Council of California (ASC), Chapter #42, proposed and was funded, by The California Chancellor's Office - Vocational Education Special Projects, to develop and implement a 2 year certification program for automotive service technician - AUTOMOTIVE TECHNICIAN INTERNSHIP PROGRAM (ATIP). The partnership included several non-union shops employing and sponsoring interns in a combined classroom/laboratory training and worksite hands on paid training at a non-union shop.

I. NEED

The automotive industry is experiencing a severe shortage of qualified technicians to service the vehicles currently being produced. Current estimates place the nationwide shortage at between 25,000 to 35,000 needed just to handle work currently available. This does not account for the future needs as the number of vehicles on the road continue to increase.

Due to the complexity of electronic and computer controlled vehicles many technicians are unable to work on the vehicles now being produced. In addition, many technicians have not maintained nor updated their skills through formal education. Compounding the shortage of qualified technicians is the departure of technicians who are in need of extensive basic skills required to function in today's workforce. This problem is also experienced by Santa Clara County Auto Service dealers who have great difficulty finding qualified individuals to fill their job openings and finding replacements for the high turn-over rate of those now employed. *EDD Labor Market Forecast, 1990.*

RESPONSE TO NEED:

The project, Automotive Technician Internship Program, ATIP, is a cooperative effort between De Anza College Automotive Technology Department and the Automotive Service Council for Independent Dealers (ASC). The Partnership was expanded to include other service providers in the area through the De Anza Occupational Training Institute such as: the Private Industry Council (PIC)-North Valley Consortium (NOVA), Dept. of Social Services Dept.(DSS) including GAIN/JTPA and Targeted Assistance Programs. The primary goal of the project proposed was to develop a two year classroom training curricula for automotive technicians that would be responsive to the current needs and technologies in use today. The project was to recruit, screen, train and provide paid internship to a minimum of 20 participants as entry level automotive technicians. A model program that would combine classroom training at De Anza College Automotive

Technology Department and work-based training (OJT), through the paid internship component, at ASC member shops.

Primary partners in the project were:

- ASC, Automotive Service Council, is an organization whose membership includes independent auto shops and dealers in the Bay Area. Chapter #42 is the local ASC chapter that provides services to Bay Area shop members.

- De Anza College Automotive Department has been providing automotive training for over 20 years. In addition to the proposed project, De Anza has an existing apprenticeship program through the Automotive Joint Apprenticeship sponsored by the Joint Apprenticeship which is affiliated with the AFL-CIO. The apprenticeship project provides assistance to unionized shops and dealers. As the training provider for the North County ROP, De Anza Automotive Department has developed a model 2+2 program that has won awards in national competitions.

Cooperative partners were:

- OTI, a grant funded De Anza College program that works with economically disadvantaged and displaced workers is funded by DSS and PIC. OTI referred qualified disadvantaged individuals to DA Automotive program for possible participation in the project.

And indirectly through OTI:

- PIC, the Private Industry Councils, administers and implements JTPA employment and training programs in the area. PIC employment and training programs services economically disadvantaged individuals and displaced workers in the area. NOVA PIC contracts with DA OTI to provide employment and training services for JTPA clientele. Several JTPA clients are in the Automotive program.

- DSS, Department of Social Services administers the Greater Avenues for Independence (GAIN) and the Targeted Assistance for Refugees (TAP) employment and training projects. Working with economically disadvantaged clients, they were an excellent resource for referrals to meet the project goals for gender equity and disadvantaged participants.

Additional cooperative agreements were to be developed with local Adult Education agencies and other Employment and Training Program Operators in the area. De Anza College through OTI is a member of the JTPA/GAIN Program Operators Association.

II. PROJECT DESCRIPTION:

ATIP is a program that recruits and trains interested individuals in Automotive Technology. The innovative approach included: • two days of full-time classes • a minimum of three days paid internship with a participating independent auto repair shop • and full-time employment during the Summer. ATIP is a unique work-based training program enhanced by a strong academic program specifically designed for the project. A strong commitment and participation of the Automotive Service Council membership, composed of independent auto repair shops and dealerships, enhanced the linkage between education and job placement. The project had a clearly defined path and timetable for completion, financial assistance, a job during training which is integral with their formal education, and training that was designed to focus on information and skills needed to be productive in the automotive industry. A BONUS PLAN was designed by ASC as a special incentive for retention and completion of the program. The Plan called for all participating member shops to deposit on a quarterly basis monies into the credit union account for each of their employee-interns. The bonus was to be paid to the participant after the completion of the 3 year training plan which included the two year classroom training and an additional 1 year full-time employment at the ASC sponsoring auto shop.

Through the cooperation of the Occupational Training Institute, Private Industry Councils in the local area, and the Department of Social Services, specialized recruitment was done to encourage disadvantaged, minorities and women to participate in the project. Recruitment of targeted population was to enhance gender equity in a vocational program.

ATIP was designed to be a model skill training program that could strengthen the relationships and linkage among local education agencies, private sector and community based organization. It was a program that would provide much needed skill training in response to current labor market needs of the area. The program provided an excellent opportunity for those interested in the automotive industry. Opportunities for continuing education were made available through the regular De Anza College's Automotive Technology Department's AS Degree program, and through specialized Certificated and upgrading programs.

The project proposed benefited ASC independent shops with the establishment of an excellent resource for consistently well trained, motivated, and competent entry level technicians. With the participation of the private sector employers, vocational students benefited from work-based learning experiences as well as excellent theoretical and hands-on experiences in the classroom.

III. GOALS:

Goals of the project were:

- Expansion of the De Anza Automotive Technology Advisory Committee to include community based organizations and active participation of the private sector.

- Developing close linkages and partnerships with private sector and community based organizations in the implementation of a model work-based training program.

- Coordination of resources that will enhance project services and ensure a cost effective program.

- Continued development of skills training curriculum and materials to match automotive industry current and future labor market needs and requirements.

- Development of a modularized competency based training program that includes both classroom skills training and a paid internship with private sector participants.

- Promote gender equity and improve program services that will enhance the successful completion of minorities, women and the disadvantaged in a non-traditional occupation.

- Dissemination of project model and outcomes for replication in other communities.

IV. PROJECT EVALUATION AND OUTCOMES:

THE RESULTS AND SUCCESS OF THE PROJECT, ATIP, WERE EVALUATED BASED ON THE PROPOSED OBJECTIVES AND PLANNED ACTIVITIES AS DETAILED IN THE PROPOSAL SUBMITTED IN SPRING 1991. PLEASE NOTE THAT THE BOXED ITEMS WERE THE PLANNED OBJECTIVES AND ACTIVITIES. NARRATIVE THAT FOLLOWS EACH BOX DESCRIBES THE ACTUAL OUTCOMES AND SUCCESSFUL IMPLEMENTATION OF THE PLANS.

1. Expansion of the De Anza Automotive Technology Advisory Committee to include community based organizations and active participation of the private sector.

1.1 Develop and expand partnerships with other ACS member shops, community based organizations, PICs, LEAs and others that will enhance cooperation and linkages. These may include but are not limited to non-financial cooperative agreements, service provisions, and other activities instrumental to the success of the participants in the project.

1.2 Increase membership of ATIP Advisory Committee to include CBOs, PICs and other service resources.

1.3 Develop and implement a marketing plan to inform other CBOs and ASC shops of the services and training opportunities available through ATIP.

Ten additional shops participated in 91-92. However, retention of participants became a problem during the year. A total of 9 dropped from the training program due to various reasons: illness, lack of motivation etc..

ASC marketed the program actively to their membership through their newsletter, monthly meetings and actual phone solicitations. The poor economy has affected the projected number of new shops willing to invest into the program. Labor market needs dramatically dropped from the prior year due to slow business.

Linkage with the OTI program at De Anza was strengthened. Although none of the OTI referrals ended in the ATIP project, several of them decided to pursue automotive training through JTPA or GAIN funded projects.

A strong marketing blitz was developed and implemented in the last six months of the project. Mailers were sent out to 1200 ASC Member shops in the local area. This resulted in several inquiry calls from interested ASC Shops. Display panels and information desks at two auto shows were manned by ATIP students, ATIP Sponsor Shops and DA instructional staff. Special flyers informing them of the ATIP Program were handed out.

Through the OTI staff, informational meetings were held for possible JTPA and GAIN participants who had interests in automotive technology. JTPA and GAIN staff were also informed of the availability of the program.

Mr. Michael Brandt went to several high schools and community organizations to market the program. These resulted in a high interest for the program from prospective students. However, student interests were not matched by sponsor shops due to the poor economy and poor business conditions at the present time.

2. Develop and increase close linkages and partnerships with private sector and community based organization in the implementation of a model work-based training program with the active involvement of at least 10 additional shops and 3 CBOs.

2.1 Develop and implement an outreach program to ASC automotive shops to increase interest and participation in the project.

2.2 Produce a brochure and flyer for mass mailing and/ or advertising of program through various media.

2.3 Active involvement of participating shops, CBOs and other community groups in the quarterly Advisory Meetings to review training progress, curriculum, staffing etc..

2.4 Design and initiate funding development for the project to be a self-supporting enterprise within the College.

2.5 Design a cooperative work experience module to ensure that the work-based OJT experience of participants are in line with the training specified by employers.

2.6 Develop and implement a specialized recruitment for disadvantaged, minorities and women into the program to help employers meet their affirmative action goals.

Linkages with recruitment resources were strengthened throughout the year. These linkages resulted in a high interest to participate in the program. As previously described, the poor economy which resulted in slow business for member shops did not produce that much interest from possible sponsoring shops. The outreach program for prospective students was very strong within the College staff. However, due to the stagnant economy and poor business conditions, the outreach program for ASC member shops lost momentum in the last six months of the program. New sponsors were unwilling to make a large financial commitment at this time.

The mass mailing of flyers was accomplished prior to the two automotive shows in Santa Clara County. A total of 1200 flyers and invitations were sent to locally targeted shops. The results were dismal. About 10 phone inquiries were received from automotive shops.

The program was advertised in each of the College quarter schedule (FALL, WINTER, SPRING AND SUMMER). This has developed a great interest for potential students for ATIP. Most of those who inquired enrolled in the regular automotive programs and are waiting for sponsorship from shops.

Quarterly meetings were held with the ATIP Executive Committee and the ASC Sponsor Shops. These meetings became a medium for discussions on how to improve the program for the future. At the last Advisory Meeting, the current sponsoring shops had decided to not start a new group for 92-93 but to wait until the economy gets better. However, current participants and those who maybe interested in future participation were encouraged to enroll in the regular automotive course offered through the College. Sponsor shops had reaffirmed their commitment to the program and will continue to provide support and flexibility for their ATIP students to continue with the internship program.

The cooperative work experience curriculum was developed and passed by the curriculum committee. However, it was protested by the COOP- ED program at the College. Students will therefore be encouraged to participate in the regular COOP-ED program. The Automotive Department and Cooperative Education units will need to discuss this issue further.

3. Coordination of resources that will enhance project services and ensure a cost effective program.

3.1 Identify funding resources for additional support services for participants based on their needs. These may include but are not limited to financial aids, child care, counseling, housing, etc.

3.2 Identify and seek additional funding support for project materials, equipment, tools etc.. especially for needy participants.

3.3 Coordinate resources to ensure cost-effectiveness of the program. Identify and utilize existing resources available from the various cooperating agencies involved in the project and/or as available in the community.

Since a number of participants in the program were determined to have special needs, financial, tutorial etc.., every effort was made by project staff to refer students to a variety of resources within the College.

College vocational education funding and Montoya funds were made available to assist the program. This was part of matching funds for the project. Since tools were not an allowable expense, ATIP Sponsor Shops have invested in 9 tool sets for the use of ATIP sponsored students. An additional set was provided by the College.

Every effort was made to ensure that the program remained cost effective and services were not duplicated.

Each student was provided with a customized quarterly program developed and monitored by the automotive staff. This greatly facilitated the students progress toward the ATIP degree.

4. Continued development of skills training curriculum and materials to match automotive industry current and future labor market needs and requirements.

4.1 Curriculum review and development will be on-going based on input provided by employers participating in the project.

4.2 Instructional staff will also continue to survey automotive manufacturers for current trends, training opportunities and resources for project staff and participants.

4.3 NOVA PIC will provide updated labor market trends based on their annual labor market analysis of Santa Clara County.

Although labor market projections were strong when the project was proposed, the economy in the area turned downward very quickly during the implementation phase. Every effort was made to recruit member shops for the 92-93 program year however, poor business conditions did not allow the shops to participate at this time. The ATIP Executive Committee is still a strong supporter and will continue to recruit for the program in the coming year for possible re-implementation in 93-94.

Curriculum review and improvements were made during the year. Most of the sponsor shops came for a site visit at the College to observe and provide feedback about the curriculum and program results based on the skills learned by their sponsored student.

Informal surveys were made by instructional staff of sponsor shops regarding their participants. This is a deficiency of the project and a more formalized approach should have been implemented. Future program evaluations will require additional staffing outside of the College paid staff to ensure that all aspects of the program are included.

5. Development of a modularized competency based training program that includes both classroom skills training and a paid internship with private sector participants.

5.1 Complete the development of a 39 unit modularized competency based training program using currently identified skill areas.

5.2 Identify staff development needs and funding sources for continued upgrading of staff and provide opportunities for currency in the field.

5.3 Submit and process approval of curriculum from College Curriculum Committee, COEAC (Campus Occupational Education Advisory Committee), and Chancellor's Office.

5.4 Review monitoring process of on-the-job training provided by employers. Provide assistance and support to ensure qualitative evaluation is done of all project participants.

5.5 Provide completion certification of participants for each of the modules and provide feedback to employer for salary increases.

The 39 Unit modularized program was completed within the program specifications. ASC was a primary source of information in ensuring that the curriculum developed focused on the required skill sets.

All curriculum were presented to the COEAC (Campus Occupational Education Advisory Committee) and the College Curriculum Committee.

NATEF Certification has been processed. A site visit was completed in July and we are currently awaiting the recommendations of the certification board.

Automotive staff continue to update themselves through a variety of training sources from organizations involved in the auto industry, dealers, membership organizations, car manufacturers, workshops and conferences. The College provides staff development funds to those who apply.

The monitoring process of the on-the-job training component at the sponsoring shops was not done formally. Meetings were held and actual one-on-one consultations were made as needed. The quarterly meetings also became a forum for issues and concerns for both Sponsor Shops and College Staff. Issues dealt with included motivational issues of students, actual work problems encountered and curriculum. The meetings became an excellent avenue to provide support to shops who were having problems with their student/employee. Positive suggestions were made by the committee members.

Feedback was provided to employers on student completions. This was to provide incentive increases to students who successfully complete each quarter module.

Ten ATIP students completed and graduated in 1992. All program graduates are currently employed. Nine students are continuing with the program in 1992-93.

The pay schedule and increases are in the addendum section. Each module completed was a $.75/ hour increase in pay for ATIP students. With a beginning wage of $6.00/hour to $12.75 at completion of an AA degree. After completing the third year internship and passing the ASE Certification, they would be at $13.50/hour. In addition, a bonus of $3,000 for tools is paid to the intern for his/her successful participation.

6. Promote gender equity and improve program services that will enhance the successful completion of minorities, women and the disadvantaged in a non-traditional occupation.

6.1 Through OTI, NOVA PIC, DSS-GAIN, TAP and JTPA do specialized recruitment for qualified trainees. Provide additional support services through these additional resources.

6.2 Research and compile additional resources at the College and in the community to assist participants in need of special resources such as, child care, transportation, financial aid, housing, legal assistance etc..

6.3 Provide additional counseling to disadvantaged and needy participants.

Several of the students participating in the project were from minority groups. A number of them are also economically disadvantaged. However, recruitment of women into the program was not successful.

Extensive efforts were made by OTI staff to recruit GAIN and JTPA women to participate in the program without success. Future programs should recruit the shops interested in training and assisting women prior to actual recruitment of participants. This will help strengthen success of women recruited for the training and employment.

7. Documentation, evaluation and dissemination of project model and outcomes for replication in other communities.

7.1 Develop data bases to document program participation and program implementation that would include student demographics, monitoring of project goals, outcome of meetings, agreements, curriculum developed, job development activities and job placement results.

7.2 Development of project formative evaluation methods to be utilized during the implementation and summative evaluation tools and methods at completion of project.

7.3 Complete project quarterly reports and a final report for the Chancellor's Office. Disseminate Project outcomes through ED>Net, Employment and Training Network , VOCEd Workshops, conferences etc..

7.4 Provide assistance to other colleges interested in developing an ATIP project on their campus.

This final report will document all the necessary information about the program. The addendum section will include copies of actual curriculum developed for the program and materials prepared for marketing and recruiting for the project.

Because the program was just implemented, not all students who participated this year have completed. A total of ten students graduated. All ten students who graduated are still employed. Of twenty- six who started the program, sixteen are currently employed. Four of the ten who are not employed are either not sponsored or have medical/personal reasons. Six completely dropped-out of the program. Eight students will continue in 1992-93 to complete their programs.

Copies of the final report will be made available to colleges who are interested in establishing their own ATIP program with their local ASC Chapters. An application has been made to be one of a panel of presenters at a Community College Convention in 92-93. Copies of the final report will be made available at that time.

V. PROJECT MANAGEMENT:

Project Manager: Administrative Manager for the project was Maria C. Banatao. Mrs. Banatao, Acting Dean of Applied Sciences, has had extensive experience in developing, implementing and administering grant funded projects. She has had 13 years of experience in administering over 20 million dollars in grant funded programs from JTPA, GAIN, TAP, Chancellor's Office Employer Based Training Grants (EBT), Employer Training Program (ETP), Vocational Education Special Project Grants and many more. Mrs. Banatao provided the overall administrative management of the grant and ensured that contracted program and fiscal goals were accomplished.

Project Director: Mr. Les Schwoob, Automotive Technology Department Coordinator, served as Project Director for the proposed project. Mr. Schwoob has 24 years of experience as an automotive instructor at De Anza College. He has a Master's in Industrial technology from San Francisco State and also teaches part-time at San Jose State University's Industrial Technology program. He has been instrumental in the development and implementation of various cooperative agreements with the Joint Apprenticeship Programs in Santa Clara County, General Motors ASEP program, and has participated actively in various Automotive Organizations in the Bay Area. Mr. Schwoob has provided the leadership in the development and negotiations with the Automotive Service Council in this cooperative venture. As Project Director, he continued to maintain the on-going relationship with ASC and lead the ATIP Industry Advisory Committee. And as Department Head, he supervised the project instructional staff.

Project Coordinator: Mr. Michael Brandt served as Project Coordinator and lead instructor for the ATIP project. He has 16 years of teaching experience and has served as Club Advisor for the Auto Club, the most active and successful club at De Anza College. A very motivated and knowledgeable instructor, he has been able to work very closely with students who were hard- to- serve and has provided his students additional support to succeed. As Project Coordinator, he coordinated the recruitment, screening, and provide part of the classroom instruction. In addition, he worked closely with ASC participating member shops who were sponsoring the paid internship training for participants.

VI. BUDGET ANALYSIS

Only sixty percent of the federal funds allocated for the project was expended. The low expenditure was due to the slow start for the project, a copy of the approved project contract was not received by the project director until mid - October, 1991. This was a result of poor communication between District Office (the contract was sent to the Chancellor) and the Project Staff. In addition, other resources were made available that increased the actual matching funds for the ATIP Program.

Project funds were primarily utilized for supplies, materials, and other operations costs. In retrospect, additional monies should have been allocated for additional staff to coordinate some of the activities. This would have strengthened the program operations.

Because of the lengthy approval process for specific items as required by the grant, implementation of activities are sometimes held-up. This process should be shortened to assist program operators in successfully achieving objectives for their projects.

The next two pages detail the planned versus actual expenditures for the grant. Both federal funds and matching funds are outlined.

Expenditure	Classifications	MATCHING FUNDS Local Funds		FEDERAL FUNDS PL 98-524		TOTAL	
		PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL
1100	**Teacher Salaries**	$14,953	$24,931	$5,500	$895	$20,453	$25,826
	TEACHER SALARIES --Classroom teaching for all ATIP Courses; Finalize Curriculum for the ATIP program.	$14,953	$12,289 $12,642	$5,500	$895		
1200	**Supervisor Salaries**	$13,251	$13,251			$13,251	$13,251
	MANAGEMENT OF PROJECT --MARIA C. BANATAO Overall administrative mgmt. of project. --LESLIE SCHWOOB Project Director; direct supervision of ATIP staff.	$7,556 $5,695	$7,556 $5,695				
1200	**Counselor Salaries**	$2,250				$2,250	$0
	COLLEGE COUNSELOR --College counselor assigned to DIV.	$2,250					
1400	**Non-Instructional Salaries**	$9,750	$9,750	$4,200	$3,724	$13,950	$13,474
	RECRUITMENT & COORDINATION --MICHAEL BRANDT: Served as liaison with shop owners and recruited participants. --PHIL GREEN: Assisted as needed --ATIP Board: Recruited, intake and referral to shops; attend quarterly meetings	$4,500 $2,250 $3,000	$4,500 $2,250 $3,000	$4,200	$3,724		
2100	**Clerical Salaries**	$2,859	$2,859	$300	$212	$3,159	$3,071
	SECRETARIAL SUPPORT: --SALLY LARSON: Division secretarial support to the program.	$2,859	$2,859	$300	$212		
2200	**Instructional Aides Salaries**	$5,638	$5,638			$5,638	$5,638
	TECHNICIAN SUPPORT: --JACK BRITTON: Floor support and managed all requisitions, supplies, and services for the project --STEVE WALTON: Shop floor support and repair	$3,478 $2,160	$3,478 $2,160				
2300	**Other Classified Salaries**	$1,119	$1,119			$1,119	$1,119
	TOOL CRIB SUPPORT: --Kathy Roesky Tool Crib Asst.	$1,119	$1,119				

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Expenditure	Classifications	MATCHING FUNDS Local Funds PLANNED	State Funds ACTUAL	Fed.Funds PL 98-524 PLANNED	ACTUAL	TOTAL PLANNED	ACTUAL
3000	**Employee Benefits**	$11,213	$11,796	$100	$461	$11,313	$12,257
	CLASSIFIED:	$3,750	$3,750				
	CERTIFICATED	$6,027	$6,610	$100	$461		
	MANAGEMENT	$1,436	$1,436				
4100	**Textbooks, Other Books**						
4XXX	**Supplies**			$27,200	$15,185	$27,200	$15,185
	MISC. SUPPLIES --Variety of supplies and materials for shop floor lab classes, videos, and other consummables used in classroom.			$27,200	$15,185		
5XXX	**Contracts (Services)**		$1,427	$900		$900	$1,427
	NATIF Certification consultant and Evaluator		$1,427	$900			
5XXX	**Conference, Travel**			$294	$57	$294	$57
	Sacramento and local travel			$294	$57		
5XXX	**Contracts, Rents**			$5,000	$3,343	$5,000	$3,343
	Misc. repair contracts			$5,000	$3,343		
5XXX	**Utilities & Housekeeping**			$1,400	$1,295	$1,400	$1,295
	Misc. utilities: Dues & memberships, Haz. Mat. Trash & Garbage,postage & mailing etc..			$1,400	$1,295		
6400	**Equipment/Lease Purchase**		$9,000	$900	$941	$900	$9,941
	Equipment lease & purchase		$9,000	$900	$941		
	TOTAL DIRECT COSTS	$61,033	$79,771	$45,794	$26,113	$106,827	$105,884
	TOTAL INDIRECT COSTS (7%)	$4,272	$5,584	$3,206	$1,828	$7,478	$7,412
	TOTAL PROGRAM COSTS	$65,305	$85,354	$49,000	$27,941	$114,305	$113,295

SUMMARY

ATIP project created a model cooperative agreement among industry, education and the community. It is a highly successful work-based training program that provided both the hands-on and academic skills required in today's workforce. Most participants showed excellent motivation. This can be attributed to the paid work experience and the opportunity to receive a college degree while in training. The automotive shops who participated were committed to the program and supported their students in every possible way.

The project completed the 39 Unit modularized curriculum with input from the sponsor shops. Continued participation of sponsor shops in improving the curriculum and actual classroom implementation will ensure that training provided meets the needs of the industry.

The poor economy has impacted independent shop owners and did not allow for a new group to be started in Fall of 1992. However, the ATIP Advisory Committee has made a commitment to continue to pursue new sponsor shops and recruitment of student participants for Fall 1993. Those who started the program will continue with their training through the regular Automotive program and their paid internship through their sponsor shops.

Other avenues are also being pursued for funding through other resources such as Employer Training Funds (ETP).

ADDENDUM

ATIP PROJECT 91-92

INTERNSHIP PROGRAM

PAY SCHEDULE

COMPLETION OF #	WAGE INCREASE	WAGE TOTAL*		COURSE #(S)	COURSE TITLE
MODULE 1	$.75	$6.75	Y E A R	70 & 74	BASIC SKILLS/HAZ MAT ENGINE DIAGNOSIS
MODULE 2	$.75	$7.50		71 & 72	BRAKES STEERING & SUSPENSION
MODULE 3	$.75	$8.25		73	FINAL DRIVE
MODULE 4	$.75	$9.00	1	79A	AUTO INTERN 1ST HALF (summer program)

All above amounts and schedules are fixed for all students. Modules 5 thru 8 are MINIMUMS. Additional incentives may be paid with approval from advisory committee.

MODULE 5	$.75	$9.75	Y E A R	75A	AUTO ELECTRICAL
MODULE 6	$.75	$10.50		75B	AUTO TUNE-UP
MODULE 7	$.75	$11.25		76	AIR CONDITIONING
MODULE 8	$.75	$12.00	2	79B	AUTO INTERN 2ND HALF (summer program)

After completion of module 8, amounts listed are minimums. Employer may pay additional incentives, but must notify committee.

A.A. DEGREE	$.75	$12.75	Y E A R 3
CERTIFICATION AS ASE MASTER TECH	$.75	$13.50	

All time spent on-the-job will be considered as inclusive to the Auto Intern Modules. Upon completion of all course study (modules 1 thru 8), receiving AA degree in Automotive Technology, receiving certification in all 8 ASE areas (Master Tech), and completing a full year of work experience, the student will receive a tool award of $3,000 (retail value). The exact method for this award will be at the discretion of the employer with approval by the committee.

School will notify advisory committee of results of each module; committee will notify employer of pay increase.

* Base/starting pay is $6.00 per hour. Wage total assumes that all previously listed modules have been completed to this point; should any modules be incomplete, this increase will be in effect after completion.

DE ANZA COLLEGE
APPLIED SCIENCES DIVISION

ATIP

Automotive Technician Internship Program

Curriculum

Course #	Course Title	Total Hours	Units	Weeks
58	Hazardous Materials	6	.5	1
70A	Basic Technician Skills	36	1.5	3
71	Automotive Brake Systems	48	2	4
72	Suspension, Steering & Alignment	96	4	8
73A, B	Standard & Automatic Power Train	144	6	12
74	Engine Repair	108	4.5	9
75A	Automotive Electrical Systems	144	6	12
75B	Automotive Engine Performance	144	6	12
76	Automotive Air Conditioning	72	3	9
53A	Mechanisms	72	3	12
	Automotive Internship	TBA	3	12
		Total:	39.5 Units	

Notes:

- Length of courses based upon relative weights of ASE testing
- Classes are 12 hours per week, 6 hours per day (except 53A and 76)
- Auto classes are offered on Tuesdays and Thursdays between Noon and 6 pm
- Morning hours reserved for General Education* classes if possible

***General Education Requirements for A.A. or A.S. Degree:** (Total 28-36 Units)

English Composition, 5 Units, EWRT 1A or ESL 5
Mathematics, 0-5 Units, Math 101 or equivalent
Arts & Humanities, 7-8 Units, two courses, one Arts, one Humanities
Social & Behavioral Sciences, 8 Units, two courses, one Behavioral, one History & Society
Physical & Biological Sciences, 4-5 Units, one Physical or Biological Science
Restricted Elective Options, 4-5 Units; See College Catalog for details on all GE requirements

De Anza College Automotive Technology Major, A.A. Degree

(Automotive Chassis Technology, Automotive Machinist Technology, Automotive Tune-up Technology)
Call 408-864-8768 for Information

Prerequisites: Approved Automotive Technology Course Sequence Contract
Recommend: One year automotive educational experience (high school, ROP or De Anza 50 Series)

Major Requirements*		Units
Auto 53A	Automotive Mechanisms	3
Auto 53B**	Automotive Electrical-Mechanical	2
Auto 57A	Career Research & Employment	2

Completion of Option A, B, or C.

Option A: Machinist		
Auto 64C	High Perf Engine Prep	4 1/2
Auto 94A	Principles of 4 Stroke Cycle Gas & Diesel Engines	5
Auto 94B,C,D	Auto Machining & Engine Service (5,5,5)	15
Auto 94E	Auto Machinist Technology	10
Auto 98E	Auto Parts Counter Sales Operations	2 1/2

Option B: Tune-Up		
Auto 95A	Automotive Electronics	3 1/2
Auto 95B	Auto Battery, Cranking, Charging Systems	3
Auto 95C	Automotive Ignition Systems	3 1/2
Auto 95D	Automotive Electronic Controls	3
Auto 95E	Automotive Fuel Systems	3 1/2
Auto 95F	Automotive Fuel Injection	3 1/2
Auto 95G	Automotive Emission Control	6 1/2
Auto 95H	Cooling & Air Conditioning Systems	3
Auto 95I	Auto Tune-Up Principles	3 1/2
Auto 95J	Advanced Auto Tune-Up	3 1/2
Auto 95K	Auto Body Electrical Systems	2 1/2
Auto 95L	Auto Troubleshooting Techniques	2 1/2

Option C: Chassis/Powertrain		
Auto 91A	Automotive Brake Systems	5
Auto 91B	Active Brake Systems	1 1/2
Auto 92A	Automotive Steering & Suspension	5
Auto 92B	Automotive Alignment	5
Auto 92C	Auto Electronic Chassis Controls	1 1/2
Auto 92D	Unibody Alignment	1 1/2
Auto 93A	Automotive Final Drive Train	5
Auto 93B	Standard Transaxles	1 1/2
Auto 93C	Automatic Transmissions	5
Auto 93D	Automatic Transaxles	1 1/2
Auto 93E	Diagnostic Techniques	1
Auto 93F	Automotive Powertrain	5

*Completion of major satisfies General Education Requirements in Area A (2) Reasoning.
**Auto 53B not required for Option B Tune-Up.

De Anza College Automotive Technology Certificate Programs

(Automotive Chassis Technology, Automotive Machinist Technology, Automotive Tune-up Technology)

Prerequisite: Approved Automotive Technology Course Sequence Contract.
Recommend: One year automotive educational experience (high school, ROP or 50 series classes at De Anza).

Automotive Technology - Certificate of Proficiency

1. Complete the major requirements as listed below.
2. Complete courses listed in Option A, B, or C as listed below.
3. Complete all required automotive units with a minimum grade of "C."
4. Eligibility for Math 101 and English 100B (ESL 4).

		Units
Auto 53A	Automotive Mechanisms	3
Auto 53B*	Automotive Electrical-Mechanical	2
Auto 57A	Career Research & Employment	2

Completion of Option A, B, or C.

Option A: Machinist

Auto 64C	High Performance Engine Preparation	4 1/2
Auto 94A	Principles of 4 Stroke Cycle Gas & Diesel Engines	5
Auto 94B,C,D	Auto Machining & Engine Service (5,5,5)	15
Auto 94E	Auto Machinist Technology	10
Auto 98E	Auto Parts Counter Sales Operations	2 1/2

Option B: Tune-Up

Auto 95A	Automotive Electronics	3 1/2
Auto 95B	Auto Battery, Cranking, Charging Systems	3
Auto 95C	Automotive Ignition Systems	3 1/2
Auto 95D	Automotive Electronic Controls	3
Auto 95E	Automotive Fuel Systems	3 1/2
Auto 95F	Automotive Fuel Injection	3 1/2
Auto 95G	Automotive Emission Control	6 1/2
Auto 95H	Cooling & Air Conditioning Systems	3
Auto 95I	Auto Tune-Up Principles	3 1/2
Auto 95J	Advanced Auto Tune-Up	3 1/2
Auto 95K	Auto Body Electrical Systems	2 1/2
Auto 95L	Auto Troubleshooting Techniques	2 1/2

Option C: Chassis/Powertrain

Auto 91A	Automotive Brake Systems	5
Auto 91B	Active Brake Systems	1 1/2
Auto 92A	Automotive Steering & Suspension	5
Auto 92B	Automotive Wheel Alignment	5
Auto 92C	Auto Electronic Chassis Controls	1 1/2
Auto 92D	Unibody Alignment	1 1/2
Auto 93A	Automotive Final Drive Train	5
Auto 93B	Standard Transaxles	1 1/2
Auto 93C	Automatic Transmissions	5
Auto 93D	Automatic Transaxles	1 1/2
Auto 93E	Diagnostic Techniques	1
Auto 93F	Automotive Powertrain	5
	Total Units Required:	44-48 1/2

*Auto 53B not required for Option B Tune-Up.

De Anza College Automotive Technology Certificate Programs

Automotive Technology - Certificate of Achievement

		Units
Auto 53A	Automotive Mechanisms	3
Auto 53B	Automotive Electrical-Mechanical	2
Auto 57A	Career Research & Employment	2

Completion of Option A or B.

Option A: Chassis

Auto 91A	Automotive Brake Systems	5
Auto 91B	Active Brake Systems	1 1/2
Auto 92A	Automotive Steering & Suspension	5
Auto 92B	Automotive Wheel Alignment	5
Auto 92C	Auto Electronic Chassis Controls	1 1/2
Auto 92D	Unibody Alignment	1 1/2

Option B: Powertrain

Auto 93A	Automotive Final Drive Train	5
Auto 93B	Standard Transaxles	1 1/2
Auto 93C	Automatic Transmissions	5
Auto 93D	Automatic Transaxles	1 1/2
Auto 93E	Diagnostic Techniques	1
Auto 93F	Automotive Powertrain Service	5

Total Units Required: 26-26 1/2

De Anza College A.A. Degree - Automotive Technician - Evening Program

Call 408-864-8768 for Information

General A.A./A.S. Degree Requirements

1. A minimum of 90 quarter units of college credit, 24 of which must be earned at De Anza College including:
   - all courses required in the major
   - General Education requirements for the A.A./A.S. degree

2. A minimum 2.0 grade point average in all college courses, all courses taken at De Anza College, and all courses required for the major.

Prerequisites: Completion of a four-year apprenticeship or Automotive Service Excellence (ASE) certification.

Recommended: One year automotive educational experience (high school, ROP or 50 series classes at De Anza).

Major Requirements*		Units
Auto 53A	Automotive Mechanisms	3
Auto 60	Automotive Electrical Systems	9

Select Option A,B,C, or D and complete courses listed.

Option A: Engine Repair		
Auto 64A	Engine Diagnosis & Overhaul	4 1/2
Auto 64B	Engine Remanufacturing	4 1/2
Auto 64F	Automotive Diesel Systems	4 1/2
Auto 65E	Automotive Cooling Systems	3 1/2
Auto 65M or	Automotive Electronic Controls (4 1/2)	
Auto 64C	High Performance Engine Preparation (4 1/2)	4 1/2

Option B: Tune-Up		
Auto 65A	Automotive Carburetor Systems	4 1/2
Auto 65D	Ignition Analysis & Oscilloscope	4 1/2
Auto 65G	Automotive Systems Troubleshooting	4 1/2
Auto 65I**or	Bosch Auto Fuel Injection Systems (4 1/2)	
Auto 65N**	Domestic Auto Fuel Injection Systems (4 1/2)	4 1/2
Auto 65L	BAR Approved Inspection & Maintenance	6 1/2
Auto 65M	Automotive Electronic Controls	4 1/2
Auto 66	Automotive Air Conditioning	4 1/2

**Recommend both classes

Option C: Chassis		
Auto 61	Automotive Brake Systems	4 1/2
Auto 62A	Auto Suspension, Steering & Alignment	9
Auto 62B	Electronic Control Brake/Chassis	4 1/2
Auto 62C	Automotive Unibody Alignment	4 1/2

Option D: Powertrain		
Auto 63A	Automotive Drive Train	4 1/2
Auto 63B	Automatic Transmissions	4 1/2
Auto 63C	Automotive Transaxles	4 1/2
Auto 63D	Transmission Diagnosis/Repair Technique	4 1/2

*Completion of major satisfies General Education Requirements in Area A (2) Reasoning.

NOTE: See counselor for academic planning and to petition for A.A./A.S. degree, 408-864-8841

De Anza College Automotive Technician - Evening Program

Call 408-864-8768 for Information

Certificate of Proficiency

1. Complete the major requirements as listed below.
2. Complete courses listed in Option A, B, C or D as listed below.
3. Complete all required automotive units with a minimum grade of "C."
4. Eligibility for Math 101 and English 100B (ESL 4).

Prerequisites: Completion of a four-year apprenticeship or Automotive Service Excellence (ASE) certification.

Recommended: One year automotive educational experience (high school, ROP or 50 series classes at De Anza).

Course Requirements		Units
Auto 53A	Automotive Mechanisms	3
Auto 60	Automotive Electrical Systems	9

Select Option A,B,C, or D and complete courses listed.

Option A: Engine Repair		
Auto 64A	Engine Diagnosis and Overhaul	4 1/2
Auto 64B	Engine Remanufacturing	4 1/2
Auto 64F	Automotive Diesel Systems	4 1/2
Auto 65E	Automotive Cooling Systems	3 1/2
Auto 65M or	Automotive Electronic Controls	
Auto 64C	High Performance Engine Preparation	4 1/2

Option B: Tune-Up		
Auto 65A	Automotive Carburetor Systems	4 1/2
Auto 65D	Ignition Analysis & Oscilloscope	4 1/2
Auto 65G	Automotive Systems Troubleshooting	4 1/2
Auto 65I*or	Bosch Auto Fuel Injection Systems (4 1/2)	
Auto 65N*	Domestic Auto Fuel Injection Systems (4 1/2)	4 1/2
Auto 65L	BAR Approved Inspection & Maintenance	6 1/2
Auto 65M	Automotive Electronic Controls	4 1/2
Auto 66	Automotive Air Conditioning	4 1/2

*Recommend both classes.

Option C: Chassis		
Auto 61	Automotive Brake Systems	4 1/2
Auto 62A	Auto Suspension, Steering & Alignment	9
Auto 62B	Electronic Control Brake/Chassis	4 1/2
Auto 62C	Automotive Unibody Alignment	4 1/2

Option D: Powertrain		
Auto 63A	Automotive Drive Train	4 1/2
Auto 63B	Automatic Transmission	4 1/2
Auto 63C	Automotive Transaxles	4 1/2
Auto 63D	Transmission Diagnosis/Repair Technique	4 1/2

Total Units Required: 30-45 1/2

NOTE: See counselor for academic planning and to petition for certificate.

APPENDIX A4

INTERNSHIP PROGRAM

CURRICULUM SCHEDULE

COURSE #	COURSE TITLE	TOTAL HOURS	UNITS	WEEKS
70	BASIC SKILLS & HAZARDOUS MATERIALS	36	1.5	3
71	BRAKES	48	2	4
72	STEERING & SUSPENSION	96	4	8
73	FINAL DRIVE	144	6	12
74	ENGINE DIAGNOSIS	108	4.5	9
75A	AUTO ELECTRICAL	144	6	12
75B	AUTO TUNE-UP	144	6	12
76	AUTO AIR CONDITIONING	72	3	12
79	AUTO INTERN	TBA	3	12
53A	MECHANISMS	72	3	12

NOTES:

1. Course lengths are based upon relative weights of ASE testing.
2. Classes are 12 hours per week, 6 hours per day. (except 53A & 76)
3. Classes will be Tuesday & Thursday in the noon to 6pm time block.
4. Morning hours will be set aside for General Education, if possible.

AUTOMOTIVE TECHNICIAN INTERNSHIP PROGRAM
PROGRAM BEGINNING ____/____/____
SPONSORING SHOP AGREEMENT

BETWEEN _____, A SPONSORING SHOP IN THIS INTERNSHIP PROGRAM, AND THE GOVERNING BODY OF THIS INTERNSHIP PROGRAM.

I agree that our goal is to develop formally educated and industry certified Automotive Technicians with well-developed on-the-job skills within three years from the start of this program. We will accomplish this goal through a planned, monitored and adjusted program offering formal studies coupled with on-the-job education and experience.

I agree that in order to accomplish the above goal I will adhere to the following standards:

1. I will abide by all guidelines established for this program. This includes but is not restricted to pay schedules, deposits for program incentive awards, and reporting practices. Guidelines will be established or modified by a 2/3 vote of all present at a regular A.T.I.P. Advisory Committee (hereafter referred to as "Committee") meeting.

2. I will attend and participate in a minimum of one Committee meeting per quarter each year.

3. I will pay the amount determined by the Committee to the designated party at the established time. This will assure the accumulation of the promised incentive bonus for each participant from my facility for presentation at the conclusion of this program. I agree to pay any late charges assessed as a result of missed payment schedule deadlines. I further agree that any funds accumulated as a result of the above are part of the program and are subject to distribution within the program only. I understand these funds are not for my, or any other participants, personal use.

4. I will interview, hire and monitor all potential interns in an ethical and professional manner, as directed by the Committee.

5. I will keep all information regarding program participants and their results confidential. This information will only be supplied to the Committee or at its direction.

6. I will monitor the on-the-job progress of my intern(s) in the manner and on the schedule determined by the Committee. I understand that days of class missed by my intern may result in mandatory matching days off work. I understand that this is intended to strengthen the necessity of the formal education aspect of this industry. I will give appropriate feedback to the committee regarding the effectiveness of this program.

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7. I will be sure that I know who my assigned trainer is at all times. If I am unsure who my trainer is, I will notify my sponsoring employer or if necessary my Internship Committee Student Representative.

8. I will conduct myself in a manner which supports the effectiveness of this program.

9. I will abide by all local, federal, and state laws regarding participation in this program.

10. I will strive to improve this program at all times. I will contribute in a positive and constructive manner any information which may be beneficial to the overall results.

11. In the event that I am unable or unwilling to comply with the terms of this program, I will immediately notify my Student Representative. I understand that willfully breaking the agreed upon guidelines for this program may result in forfeiture of all monies, materials and participation in this program. I also understand that any educational credits I earn during the course of study apply only to the completion of this program and are not transferable.

12. I understand that this program is designed to be three years in length. I intend to stay with my sponsor for this entire time so that I may receive my incentive tool bonus upon successful completion. If I do not complete the requirements during the time allotted, I understand that I will not receive this bonus unless negotiated otherwise with the Advisory Committee and my Sponsor.

13. In the event that I am unable or unwilling to continue with my chosen on-the-job Sponsor, I may request a change of sponsorship from the Advisory Committee. I understand that the Committee cannot guarantee the successful reassignment to another Sponsor, but will do whatever is possible to assure a facility for the completion of the program. Should that not be possible I understand that I may be dropped from the program with no course or incentive bonus credit.

I have read the above written standards and goals and I agree that if I fail to follow them, I can be removed from the program.

DATE: _____ SIGNED: _____

SPONSOR SHOP: _____ CITY: _____

SIGNING FOR THE ADVISORY COMMITTEE OF THE AUTOMOTIVE TECHNICIAN INTERNSHIP (ATIP) PROGRAM:

_____ NAME: _____

Original to ATIP Coordinator. Copies to Sponsor and Student

AUTOMOTIVE TECHNICIAN INTERNSHIP PROGRAM
PROGRAM BEGINNING ___/___/___
STUDENT INTERN AGREEMENT

BETWEEN _____, A PARTICIPATING STUDENT IN THIS INTERNSHIP PROGRAM, AND THE GOVERNING BODY OF THIS INTERNSHIP PROGRAM.

I agree to fully participate in this program in order to accomplish the goal of becoming a formally educated and certified Automotive Technician with well developed on-the-job skills within three years from start of this program. I will accomplish this goal thru a planned, monitored and adjusted program offering formal studies coupled with on-the-job education and experience.

I agree that in order to accomplish the above goal I will abide by the following standards:

1. I will follow all guidelines established by the Internship Committee in order to accomplish the programs goals.

2. I will attend all scheduled classes and on-the-job training. I will be on time and prepared for all sessions. I will make up all missed classes and understand that I may have mandatory time away from work equal to the hours of classes missed.

3. I will purchase all supplies, including books, tools and training materials needed to properly participate in this Internship Program. Should I become aware of any problems in complying with this standard, I will notify my instructor and on-the-job trainer immediately and resolve the problem. I agree that any materials or tools purchased on a co-op basis with my employer for use in this program will revert to the program should I quit or be dropped from the program. This means I will be repaid for my exact costs on these items and the items will remain the property of the program.

4. I will conduct myself in a professional manner as a representative of this program.

5. I will keep all information regarding other program participants and their results confidential. Information will only be supplied to the Internship Committee or at its direction.

6. I will participate in on-the-job training in the manner and on the schedule determined by the Internship Committee. I will give appropriate feedback to the Internship Committee regarding effectiveness of on-the-job program.

7. I will assure that each student in my employ has an assigned trainer at all times. I will assure that this trainer has the necessary skills and desire to assist this student in their training and development. If so requested, I will assure the attendance of this individual at any committee-sponsored trainer trainings.

8. I will conduct my business and myself in a manner which supports the effectiveness of this program and the ASC Code of Ethics. I understand that I must be a member in good standing of ASC to participate in this program.

9. I will abide by all Local, Federal and State laws while implementing this program.

10. I will strive to improve this program at all times. I will contribute in a positive and constructive manner any information which may be beneficial to the overall results. I will be an active participant in the development of the individuals and the program as a whole.

11. In the event that I am unable to discharge the terms of this program, I will immediately notify the Program Coordinator. I understand that willfully breaking the guidelines for this program may result in forfeiture of all monies, materials and participating students which are a part of this program.

12. In the event that the student I am sponsoring appears unable or unwilling to discharge the terms of their student employment, I will immediately notify the Program Coordinator. I understand that the Committee cannot guarantee the successful completion of this program by any student, but will do whatever is possible to provide a student to my facility for the completion of the program. Should that not be possible, I may elect to:
    A. move my accrued program funds to a future program, if it exists, or;
    B. withdraw from the program and leave my funds for the use of the other participants.

13. I will pay all tuition costs for my student in a timely manner.

I have read and understand the above standards and goals and agree to uphold them as written. I have submitted my non-refundable sponsor registration fee to establish my willingness to participate in this program.

DATE: _____ NAME: _____

COMPANY: _____ CITY: _____

SIGNED: _____ TITLE: _____

SIGNING FOR THE COMMITTEE: _____ DATE: ___/___/___

Amount Received $_____ Cash[] Check[] Other[] _____

Original to ATIP Coordinator. Copy to sponsor.

DE ANZA COLLEGE
APPLIED SCIENCES DIVISION
COURSE OUTLINE

Automotive Technology X58 Fall 1990

I. Catalog Information

AUTO X58 Hazardous Materials .5 Units

Prerequisites: Eligibility for Reading 91 or English As A Second Language 4 recommended.

Six hours lecture per quarter

Proper handling of hazardous materials in the automotive trade.

II. Course Objectives

The student will:

A. Identify a hazardous material

B. Discuss hazardous material laws

C. Use types of exposure/first aid procedures

D. Use protective equipment

E. Properly dispose of hazardous materials

F. Use proper clean up procedures

III. Essential Student Materials

None

IV. Essential College Facilities

None

V. Expanded Description: Content and Form

A. How to Identify a Hazardous Material
   1. Employer responsibility
   2. Employee responsibility
   3. Product label
   4. MSDS sheets

B. Exposure
   1. Long/short term effects
   2. Types
   3. Inventory roster
   4. First Aid for cases of exposure

C. Protective Equipment
   1. Types
   2. Proper use

D. Hazardous Material Storage/Mixing
   1. Procedures
   2. MSDS sheets
   3. Storage area requirements
   4. Approved containers
   5. Proper labels

E. Spills/Clean Ups
   1. Preparation before accident
   2. Clean up responsibilities

F. Hazardous Waste Disposal
   1. Laws (RCRA, State Regulations, Government Agencies)
   2. Recycling
   3. Licensed facility
   4. Proper handling equipment

VI. Assignments

Reading from text and handouts

VII. Methods of Evaluating Objectives

Written final exam

VIII. Texts and Supporting References

Text:
KLM. Hazardous Materials Employees Right to Know. Washington, D.C.: KLM, 1989.

WPC/3444d

Automotive Technology X70A Fall 1990

I. Catalog Information

AUTO X70A Basic Technician Skills 1.5 Units

Prerequisites: Eligibility for Reading 91 or English As A Second Language 4 recommended. Automotive Service Council course sequence contract.

Thirty-six hours lecture/laboratory per quarter

Basic skills needed by a beginning apprentice for repair and maintenance in an automotive facility.

II. Course Objectives

The student will:

A. Perform vehicle safety inspections

B. Apply the procedures for basic skill level tasks required of an apprentice mechanic

C. Properly use reference material and service manuals in the performance of daily tasks

D. Properly fill out a work order

E. Properly maintain supplies and cleanliness of the work site

F. Know proper procedures for the handling and disposal of hazardous materials that are present in the automotive trade

III. Essential Student Materials

None

IV. Essential College Facilities

None

V. Expanded Description: Content and Form

A. Lubrication System Service
   1. Oil change
   2. Chassis lubrication
   3. Checking fluid levels

B. Battery Service
   1. Hazards
   2. Remove/replace/recharge
   3. Cleaning
   4. Testing - load testing
   5. Drain test

C. Lighting System Service
   1. Headlight alignment/replacement
   2. Lighting system inspection and repairs
   3. Safety

D. Wheel and Tire Service
   1. Proper tire inspection and service
   2. Tire balance procedures
   3. Tire repair procedures
   4. Safety

E. Measuring Devices and Fasteners
   1. Proper use of the more common measuring tools used in the automotive profession
   2. Common fastener identification
   3. Repair of broken fasteners

F. Work Order Preparation
   1. Use of flat rate manuals
   2. What must be on the work order
   3. What does the estimated price include
   4. How is repair work authorized
   5. Who is the customer
   6. What should be done with signed work order

G. Hazardous Materials
   1. Identification and information
   2. Types of exposure
   3. Types of protective equipment
   4. Hazardous material storage/mixing
   5. Hazardous material disposal

H. Basic Skills Check List
   1. Safety inspections
   2. Checking fluid levels
   3. Battery service
   4. Tire balance and rotation
   5. Cleaning, inspecting paint and interiors
   6. Retorquing procedures; thread identification and repair

NOTE: The method of presentation will be lecture and demonstration with laboratory experiences that reflect each topic.

VI. Assignments

A. Reading from text and handouts

B. Write lab reports

C. Complete check lists

VII. Methods of Evaluating Objectives

A. Written laboratory reports on each required laboratory requirement

B. Written final exam; objective format

C. Practical final exam on selective laboratory requirements

VIII. Texts and Supporting References

Text:
Thiessen/Dale. Automotive Principles and Service.
Reston, Virginia: Reston, 1984.

WPC/3444d

DE ANZA COLLEGE
APPLIED SCIENCES DIVISION
COURSE OUTLINE

X Degree applicable

Automotive Technology X71 Winter 1991

I. Catalog Information

AUTO X71 Automotive Brake Systems 2 Units

Prerequisites: Approved Automotive Technology Course Sequence Contract

48 hours lecture-laboratory

Brake system theory, diagnosis, and general repair.

II. Course Objectives

The student will:

A. Define the basic design and operation of auto brake systems.
B. Classify the different types of systems.
C. Describe the accepted industry techniques for troubleshooting, maintenance and repair of these systems.
D. Demonstrate the ability to diagnose and repair these systems.

III. Essential Student Materials

Required hand tools

IV. Essential College Facilities

Automotive brake lab area

V. Expanded Description: Content and Form

A. Introduction to brake systems
   1. Brake components: general purpose
   2. Complete brake system
   3. Basic principles
B. Principles of hydraulics
   1. Pressure
   2. Force
   3. Input-output piston
   4. Brake fluid/lines/connections
C. Master cylinders/wheel cylinders
   1. Master/wheel cylinder type and construction
   2. Master/wheel cylinder operation
   3. Master/wheel cylinder maintenance and repair
   4. Master/wheel cylinder diagnosis/troubleshooting
D. Drum brake systems
   1. Drum brake types and construction
   2. Drum brake operation
   3. Drum brake maintenance and repair
   4. Drum brake diagnosis/troubleshooting

E. Disc brake systems
   1. Disc brake types and construction
   2. Disc brake operation
   3. Disc brake maintenance and repair
   4. Disc brake diagnosis/troubleshooting
F. Brake system valves and switches
   1. Valve/switch types and construction
   2. Valve/switch operation
   3. Valve/switch maintenance and repair
   4. Valve/switch diagnosis/troubleshooting
G. Power brake systems
   1. Power brake types and construction
   2. Power brake operation
   3. Power brake maintenance and repair
   4. Power brake diagnosis/troubleshooting
H. Parking brake systems
   1. Parking brake types and construction
   2. Parking brake operation
   3. Parking brake maintenance and repair
   4. Parking brake diagnosis/troubleshooting
I. Antilock brake system (ABS)
   1. ABS types and construction
   2. ABS operation
   3. ABS maintenance and repair
   4. ABS diagnosis/troubleshooting
J. Road testing and troubleshooting the complete brake system
   1. Pull
   2. Grab
   3. Pedal height (feel)
   4. Wear patterns

VI. Assignments

A. Reading from text and handouts
B. Written research project
C. Journal of lab activities

VII. Methods of Evaluating Objectives

A. Written objective examinations
B. Written report
C. Performance evaluations
D. Objective and essay final examination

VIII. Texts and Supporting References

A. Text:
McGraw-Edison. Wagner Brake Manual.
New Jersey: McGraw-Edison Publications, 1986.

DE ANZA COLLEGE
APPLIED SCIENCES DIVISION
COURSE OUTLINE

X Degree applicable

Automotive Technology X72 Winter 1991

I. Catalog Information

AUTO X72 Auto Suspension, Steering Gear and Alignment 4 Units

Prerequisites: Approved Automotive Technology Course Sequence Contract

96 hours lecture-laboratory

Suspension, steering, and alignment theory, diagnosis, and general repair.

II. Course Objectives

The student will:

A. Define the basic design and operation of suspension, steering, and alignment systems.

B. Compare methods of diagnosis.

C. Describe the accepted industry techniques for troubleshooting, maintenance and repair of these systems.

D. Demonstrate the knowledge to diagnose and repair these systems.

III. Essential Student Materials

None

IV. Essential College Facilities

Automotive lab area for demonstrations

V. Expanded Description: Content and Form

A. Introduction to the chassis
   1. Chassis components: general purpose
   2. Suspension types (front and rear)
   3. Steering linkage types

B. Tires and wheels
   1. Tire construction
   2. Tire sizing and ratings
   3. Tire/wheel balancing
   4. Replacement-repair

C. Wheels
   1. Wheel type and construction
   2. Wheel sizes
   3. Wheel offset-backspacing
   4. Wheel maintenance and repair
   5. Wheel diagnosis/troubleshooting

D. Wheel bearings
   1. Wheel bearing type and construction
   2. Preloads and adjustment
   3. Drive and non-drive wheel bearings
   4. Wheel bearing maintenance and repair
   4. Wheel bearing diagnosis/troubleshooting

E. Front suspension types
   1. Short-long arm (SLA)
   2. Control arm geometry
   3. Strut suspensions
   4. Solid axles
   5. Swing axle - twin I beam
   6. Front wheel drive axles

F. Rear suspension types
   1. Solid axle rear wheel drive
   2. Independent rear suspension
   3. F.W.D. rear axles

G. Springs
   1. Type and construction
   2. Rate and frequency
   3. Electronically controlled air suspension
   4. Spring maintenance and repair
   5. Spring diagnosis/troubleshooting

H. Shock absorbers
   1. Type and construction
   2. Damping ratio and force
   3. Computer-controlled shock absorbers
   4. Shock maintenance and repair
   5. Shock diagnosis/troubleshooting

I. Struts
   1. Type and construction
   2. Strut maintenance and repair
   3. Strut diagnosis/troubleshooting

J. Introduction to steering systems
   1. Steering components - their general purpose
   2. Complete steering system
   3. Basic principles

K. Steering columns
   1. Type and construction
   2. Collapsible steering columns
   3. Flexible couplers
   4. Steering column maintenance and repair
   5. Column diagnosis/troubleshooting

L. Standard steering gears
   1. Type and construction
   2. Preloads and adjustments
   3. Steering gear maintenance and repair
   4. Steering gear diagnosis/troubleshooting

M. Rack and pinion steering gears
   1. Type and construction
   2. Preloads and adjustments
   3. Rack and pinion maintenance and repair
   4. Rack and pinion diagnosis/troubleshooting

N. Power steering
   1. Type and construction
   2. Power steering pumps
   3. Power steering control valves
   4. Power steering hoses and fluid
   5. Power steering maintenance and repair
   6. Power steering diagnosis/troubleshooting

O. Four wheel steering
   1. Manual
   2. Electronic
   3. Four wheel steering maintenance and repair
   4. Four wheel steering diagnosis/troubleshooting

P. Alignment Angles
   1. Definition and purposes
   2. Measuring
   3. Adjusting
   4. Alignment equipment
   5. Alignment types

VI. Assignments

A. Reading from text and handouts

B. Written research project

C. Journal of lab activities

VII. Methods of Evaluating Objectives

A. Written objective examinations

B. Lab evaluations

C. Performance evaluations of repair and service procedures

D. Objective and essay final examination

VIII. Texts and Supporting References

A. Text:
Birch, Thomas W. Automotive Suspension and Steering Systems. New York: Technology Publications, 1987.

B. References:
Manufacturers' service manuals as required.

DE ANZA COLLEGE
APPLIED SCIENCES DIVISION
COURSE OUTLINE

I. AUTOMOTIVE TECHNOLOGY X73A SPRING 1991

Catalog Information

AUTO X73A **Standard Power Train** 3 Units

Prerequisites: Approved Automotive Technology Course Sequence Contract.

72 hours Lecture-Laboratory

Theory, service, repair and diagnostic techniques of standard power train.

II. COURSE OBJECTIVES

The student will be able to:

1. Identify and understand the operation of the major components in the standard power train.

2. Service each of the components in the standard power train.

3. Teardown, repair and reassemble each of the major components in the standard power train.

4. Diagnose problems in each of the major components in the standard power train.

III. ESSENTIAL STUDENT MATERIALS

Basic tool set
Power Train specialty tools
Approved work clothes and safety shoes

IV. ESSENTIAL COLLEGE FACILITIES

Power Train classroom and laboratory

V. EXPANDED DESCRIPTION: CONTENT and FORM

A. Propeller Shafts and Drive Axles

1. Theory of operation
2. Service requirements
3. Repair procedures

B. Clutches

1. Theory of operation
2. Service requirements
3. Repair procedures

C. Standard Transmissions

1. Theory of operation
2. Service requirements
3. Repair procedures

D. Rear Axles

1. Theory of operation
2. Service requirements
3. Repair procedures

VI. ASSIGNMENTS

Reading from textbooks and handouts

VII. METHOD OF EVALUATING OBJECTIVES

1. Quizzes covering lecture material.

2. Midterm examination covering standard power train theory of operation, service and repair procedures.

3. Performance examination covering course material

4. Final examination covering standard power train component inspection and repair procedures

VIII. TEXTS AND SUPPORTING REFERENCES

1. Toyota, Manual Transmissions and Transaxles, Toyota, Los Angeles, CA

2. Leigh, Automotive Drive Line, Road Runner Training, San Jose, CA

DE ANZA COLLEGE
APPLIED SCIENCES DIVISION
COURSE OUTLINE

I. AUTOMOTIVE TECHNOLOGY X73B SPRING 1991

Catalog Information

AUTO X73B Automatic Power Train 3 Units

Prerequisites: Approved Automotive Technology Course Sequence Contract.
Seventy-two hours lecture-laboratory

Theory, service, repair and diagnostic techniques of automatic power train components.

II. Course Objectives

Students will be able to:

1. understand powerflow through an automatic transmission.
2. identify and understand the operation of the major components in the hydraulic control system.
3. identify the service requirements of an automatic transmission.
4. inspect and estimate the required repairs needed to return an automatic transmission back into service.
5. diagnose problems within an automatic transmission.

III. Essential Student Materials

Basic tool set
Power Train specialty tools
Approved work clothes and safety glasses

IV. Essential College Facilities

Power Train classroom and laboratory

V. Expanded Description: Content and Form

A. Torque converters and oil pumps
   1. Theory of operation
   2. Service requirements
   3. Repair procedures

B. Basic hydraulics
   1. Theory of operation
   2. Service requirements
   3. Repair procedures

C. Planetary gears
   1. Theory of operation
   2. Service requirements
   3. Repair procedures

D. Clutches, bands and servos
   1. Theory of operation
   2. Service requirements
   3. Repair procedures

E. Control valve body and governors
   1. Theory of operation
   2. Service requirements
   3. Repair procedures

F. Rebuild standards for automatic transmissions
   1. Tear down and inspection procedures
   2. Repair estimates
   3. Assembly techniques

VI. Assignments

Reading assignments from textbook and handouts.

VII. Methods of Evaluating Objectives

1. Quizzes covering lecture material

2. Midterm examination covering automatic transmission theory of operation, service and repair procedures.

3. Performance examination covering course material.

4. Final examination covering automatic transmission rebuilding standards and inspection procedures.

VIII. Texts and Supporting References

1. General Motors, THM 3T60 Transaxle, General Motors Detroit, MI

2. Leigh, Automatic Transmissions, Road Runner Training, San Jose, CA

Automotive Technology X74 Fall 1990

I. Catalog Information

AUTO X74 Engine Repair 4.5 Units

Prerequisites: Approved Automotive Technology Course Sequence Contract.

One hundred eight hours lecture-laboratory

Engine theory, diagnosis, failure analysis, and general repair and overhaul procedures.

II. Course Objectives

The student will:

A. Read measuring tools and identify threads

B. Apply principles of engine operation and lubricating and cooling systems to problems of diagnosis

C. Compare methods of diagnosis

D. Disassemble and clean engine parts and assemblies

E. Analyze causes of engine failures

F. Determine wear limits and discuss reconditioning options

G. Assemble engines

H. Remove and replace timing belts, water pumps and drive belts

III. Essential Student Materials

Basic tool set

IV. Essential College Facilities

None

V. Expanded Description: Content and Form

A. Measuring Tools and Fasteners
   1. Using micrometers
   2. Units of measurement
   3. Making transfer measurements
   4. Using dial indicators and dial bore gauges
   5. Strength of fasteners

6. Clamping force versus torque
7. Identifying threads
8. Removing broken fasteners
9. Installing helicoils

B. Engine Diagnosis
1. Outward signs of engine wear
2. Block checks
3. Power balance testing
4. Compression testing
5. Cylinder leakage testing
6. Valve timing tests
7. Manifold vacuum tests
8. Exhaust back pressure tests
9. Engine noises

C. Engine Disassembly
1. Hints for disassembly in the chassis
2. Disassembling cylinder heads
3. Numbering rods and main caps
4. Removing piston and rod assemblies
5. Removing timing sets
6. Removing the crankshaft
7. Removing the camshaft and followers
8. Removing oil plugs and core plugs

D. Cleaning Engine Parts
1. Solvents and solutions
2. Controlled oven cleaning
3. Airless shot blasting
4. Descaling
5. Bead blasting
6. Hand and power tools

E. Inspecting Valve Train Components
1. Determining valve guide wear
2. Checking valves
3. Testing valve springs
4. Inspecting camshafts and lifters/followers
5. Checking timing chain slack or gear backlash
6. Inspecting rocker arms and pushrods
7. Checking cylinder head surface condition

F. Crack Detection
1. Magnetic particle inspection
2. Wet magnaflux
3. Dye penetrants
4. Pressure testing

G. Reconditioning Valve Train Components
1. Removing and replacing valve guides
2. Fitting oversize stems
3. Refacing valves and valve stems

4. Grinding valve seats
5. Cutting valve seats
6. Fitting valve seals
7. Replacing rocker arm studs
8. Correcting installed spring heights
9. Correcting installed stem heights
10. Refacing rocker arms
11. Straightening aluminum cylinder heads and correcting camshaft center lines

H. Resurfacing
1. Resurfacing machines
2. General precautions
3. Correcting V-block intake manifold alignment

I. Inspecting Short Block Components
1. Measuring cylinder wear
2. Measuring piston clearance
3. Checking pistons
4. Checking piston pin clearance
5. Checking cylinder block flatness
6. Measuring main bearing bores
7. Checking the crankshaft
8. Measuring connecting rod bores

J. Reconditioning Engine Block Components
1. Cylinder honing for overhaul
2. Piston knurling
3. Aligning connecting rods
4. Flywheel resurfacing and replacing ring gears
5. Oil pump service

K. Engine Assembly
1. Final cleaning and deburring
2. Cylinder head assembly
3. Installing core plugs
4. Installing camshaft bearings and camshaft
5. Installing oil galley plugs
6. Fitting the rear main seal
7. Installing the main bearings and crankshaft
8. Setting valve timing
9. Installing piston rings
10. Installing piston and connecting rod assemblies
11. Assembling cylinder heads to engine blocks
12. Installing rocker arms
13. Adjusting valves
14. Installing the oil pump
15. Pre-oiling the engine
16. Hints on gaskets, seals and sealants
17. Engine assembly checklist

L. In-Chassis Service
   1. Replacing timing belts and timing camshafts
   2. Installing belts and hoses
   3. Removing and replacing water pumps
   4. Replacing core plugs

VI. Assignments

A. Reading from text and handouts

B. Write lab journal

VII. Methods of Evaluating Objectives

A. Lab journal

B. Objective and written quizzes

C. Objective final examination

D. Attendance per department policy

VIII. Texts and Supporting References

Text:
Lewis, W. G. Engine Service, 2nd. Ed. Englewood Cliffs, NJ: Prentice Hall, Inc., 1986.

WPC/3444d

DE ANZA COLLEGE
APPLIED SCIENCES DIVISION
COURSE OUTLINE

Automotive Technology X74 Fall 1990

I. Catalog Information

AUTO X74 Engine Repair 4.5 Units

Prerequisites: Approved Automotive Technology Course Sequence Contract.

One hundred eight hours lecture-laboratory

Engine theory, diagnosis, failure analysis, and general repair and overhaul procedures.

II. Course Objectives

The student will:

A. Read measuring tools and identify threads

B. Apply principles of engine operation and lubricating and cooling systems to problems of diagnosis

C. Compare methods of diagnosis

D. Disassemble and clean engine parts and assemblies

E. Analyze causes of engine failures

F. Determine wear limits and discuss reconditioning options

G. Assemble engines

H. Remove and replace timing belts, water pumps and drive belts

III. Essential Student Materials

Basic tool set

IV. Essential College Facilities

None

V. Expanded Description: Content and Form

A. Measuring Tools and Fasteners
   1. Using micrometers
   2. Units of measurement
   3. Making transfer measurements
   4. Using dial indicators and dial bore gauges
   5. Strength of fasteners

6. Clamping force versus torque
7. Identifying threads
8. Removing broken fasteners
9. Installing helicoils

B. Engine Diagnosis
1. Outward signs of engine wear
2. Block checks
3. Power balance testing
4. Compression testing
5. Cylinder leakage testing
6. Valve timing tests
7. Manifold vacuum tests
8. Exhaust back pressure tests
9. Engine noises

C. Engine Disassembly
1. Hints for disassembly in the chassis
2. Disassembling cylinder heads
3. Numbering rods and main caps
4. Removing piston and rod assemblies
5. Removing timing sets
6. Removing the crankshaft
7. Removing the camshaft and followers
8. Removing oil plugs and core plugs

D. Cleaning Engine Parts
1. Solvents and solutions
2. Controlled oven cleaning
3. Airless shot blasting
4. Descaling
5. Bead blasting
6. Hand and power tools

E. Inspecting Valve Train Components
1. Determining valve guide wear
2. Checking valves
3. Testing valve springs
4. Inspecting camshafts and lifters/followers
5. Checking timing chain slack or gear backlash
6. Inspecting rocker arms and pushrods
7. Checking cylinder head surface condition

F. Crack Detection
1. Magnetic particle inspection
2. Wet magnaflux
3. Dye penetrants
4. Pressure testing

G. Reconditioning Valve Train Components
1. Removing and replacing valve guides
2. Fitting oversize stems
3. Refacing valves and valve stems

4. Grinding valve seats
5. Cutting valve seats
6. Fitting valve seals
7. Replacing rocker arm studs
8. Correcting installed spring heights
9. Correcting installed stem heights
10. Refacing rocker arms
11. Straightening aluminum cylinder heads and correcting camshaft center lines

H. Resurfacing
1. Resurfacing machines
2. General precautions
3. Correcting V-block intake manifold alignment

I. Inspecting Short Block Components
1. Measuring cylinder wear
2. Measuring piston clearance
3. Checking pistons
4. Checking piston pin clearance
5. Checking cylinder block flatness
6. Measuring main bearing bores
7. Checking the crankshaft
8. Measuring connecting rod bores

J. Reconditioning Engine Block Components
1. Cylinder honing for overhaul
2. Piston knurling
3. Aligning connecting rods
4. Flywheel resurfacing and replacing ring gears
5. Oil pump service

K. Engine Assembly
1. Final cleaning and deburring
2. Cylinder head assembly
3. Installing core plugs
4. Installing camshaft bearings and camshaft
5. Installing oil galley plugs
6. Fitting the rear main seal
7. Installing the main bearings and crankshaft
8. Setting valve timing
9. Installing piston rings
10. Installing piston and connecting rod assemblies
11. Assembling cylinder heads to engine blocks
12. Installing rocker arms
13. Adjusting valves
14. Installing the oil pump
15. Pre-oiling the engine
16. Hints on gaskets, seals and sealants
17. Engine assembly checklist

L. In-Chassis Service
1. Replacing timing belts and timing camshafts
2. Installing belts and hoses
3. Removing and replacing water pumps
4. Replacing core plugs

VI. Assignments

A. Reading from text and handouts

B. Write lab journal

VII. Methods of Evaluating Objectives

A. Lab journal

B. Objective and written quizzes

C. Objective final examination

D. Attendance per department policy

VIII. Texts and Supporting References

Text:
Lewis, W. G. Engine Service, 2nd. Ed. Englewood Cliffs, NJ: Prentice Hall, Inc., 1986.

WPC/3444d

DEGREE APPLIC.

DEANZA COLLEGE
APPLIED SCIENCE DIVISION
COURSE OUTLINE

Automotive Technology X75A Fall 1991

I. Catalog Information

AUTO TECH X75A AUTOMOTIVE ELECTRICAL SYSTEMS 6 Units

Prerequisite: Approved Automotive Technology Course Sequence Contract

One hundred forty four hours lecture-laboratory

Electrical, magnetic, and semi-conductor theory applicable to automotive systems. Fundamental concepts in meter usage in the diagnosis, failure analysis, and repair procedures of these systems.

II. Course Objectives

The student will be able to:

A. Calculate a simple circuit using Ohm's and Watt's Laws

B. Identify automotive lighting and accessory system components

C. Assemble a basic automotive electrical circuit

D. Analyze the causes of circuit failure

E. Interpret an automotive electrical diagram

F. Test the operation of automotive magnetic devices

G. Identify the components of the automotive Cranking System

H. Test the operation of basic automotive semi-conductor devices

I. Identify the components of the automotive Charging System

III. Essential Student Materials

A. Basic tool set.
B. Approved work clothing, safety glasses.

IV. Essential College Facilities

Automotive Technology electrical laboratory facilities.

V. Expanded Description: Content and Form

A. Electrical Fundamentals
   1. The Electron and Conventional Current Flow theories.
   2. Ohm's and Watt's Laws for simple circuits.

B. Circuit Development
   1. Component identification.
   2. Power supply usage.
   3. Breadboarding electrical circuits.
   4. Fusing and circuit protection devices.

C. Wiring Repair Techniques
   1. Safety precautions.
   2. Component preparation steps.
   3. Tools and Solder selection.
   4. Insulation procedures.

D. Wiring Diagrams
   1. Reference material selection procedures.
   2. Symbol identification.
   3. Tracing the circuit.

E. Multi-meter Usage For Testing A Circuit
   1. Ohmmeter.
   2. Ammeter.
   3. Voltmeter.

F. Lighting and Accessory Circuits
   1. Headlamp, parklamp, and running lamp circuits.
   2. Directional, and hazard lamp circuits.
   3. Interior lamp circuits.
   4. Air Conditioning and heater blower-motor circuits.

G. Magnetism and Magnetic Devices
   1. Magnetic principles.
   2. Relays, solenoids, and magnetic switches.

H. Automotive Battery Fundamentals
   1. Principles of operation.
   2. Safety precautions.
   3. Rating systems.
   4. Testing techniques.

I. Cranking System Fundamentals
   1. Motor principles.
   2. Component identification.

J. Semi-conductor Fundamentals
   1. Theory of operation.
   2. Diode, Transistor, and SCR operation.
   3. Testing techniques.

K. Charging System Fundamentals
   1. Generator principles.
   2. Component identification.
   3. Voltage regulation.

VI. Assignments

A. Reading from text and handouts

B. Write Laboratory Journal

VII. Methods of Evaluating Objectives

A. Student Notebooks and Laboratory Journals

B. Objective and written quizzes

C. Objective and final examination

D. Attendance per department policy

VII. Text and Supporting References

Halderman, James D. Diagnosis and Troubleshooting of Automotive Electrical, Electronic, and Computer Systems. 1st ed. Englewood Cliffs, N.J.: Prentice Hall, Inc., 1991.

DEGREE APPLIC.

DEANZA COLLEGE
APPLIED SCIENCE DIVISION
COURSE OUTLINE

Automotive Technology X75B Fall 1991

I. Catalog Information

AUTO TECH X75B AUTOMOTIVE ENGINE PERFORMANCE 6 Units

Prerequisite: Approved Automotive Technology Course Sequence Contract

One hundred forty four hours lecture-laboratory

Theory of operation of ignition, fuel supply, and engine performance systems including routine maintenance procedures. Diagnosis, service, and basic troubleshooting techniques.

II. Course Objectives

The student will be able to:

A. Perform timing chain wear, leakdown, and compression tests, and interpret the results

B. Safely test and recharge an automotive battery

C. Diagnose and service an automotive cranking system

D. Diagnose and service an automotive charging system

E. Interpret an automotive ignition oscilloscope pattern

F. Diagnose and service an automotive ignition system

G. Diagnose and service the fuel supply system

H. Adjust the air/fuel mixture and the idle speed of an engine

I. Troubleshoot "no-start" conditions as they apply to basic ignition and fuel supply systems

III. Essential Student Materials

A. Basic tool set.
B. Approved work clothing, safety glasses.

IV. Essential College Facilities

Automotive Technology tune-up laboratory facilities.

V. Expanded Description: Content and Form

A. Principles of Engine Performance Diagnosis
   1. Wear testing procedures
   2. Timing chain wear tests
   3. Leakdown tests
   4. Compression tests

B. Battery Testing and Service Procedures
   1. Safety precautions
   2. Battery rating systems
   3. Capacity and state-of-charge testing
   4. Recharging procedures

C. Cranking System Testing and Service Procedures
   1. Safety precautions
   2. Test instrument usage
   3. Current draw and voltage drop tests
   4. Removal and replacement procedures
   5. Bench testing procedures

D. Charging System Testing and Service Procedures
   1. Safety precautions
   2. Test instrument usage
   3. Current and voltage output tests
   4. Voltage regulator testing procedures
   5. Removal and replacement procedures

E. Ignition System Fundamentals
   1. Basic ignitions system operation
   2. Electronic ignition systems
   3. Voltmeter and Oscilloscope diagnostic procedures

F. Ignition System Testing and Service Procedures
   1. Safety precautions
   2. Distributor installation, wiring, and timing procedures
   3. Oscilloscope testing procedures
   4. "No-Start" troubleshooting procedures

G. Fuel Supply System Fundamentals
   1. Fuel pumps and filters
   2. Basic carburetion
   3. Basic electronic fuel injection

H. Fuel Supply System Testing and Service Procedures
   1. Safety precautions
   2. Test instrument usage
   3. Fuel pump testing
   4. Air/fuel mixture and idle speed adjustment procedures
   5. Four Gas Analyzer testing techniques
   6. "No-Start" troubleshooting procedures

I. Engine Performance Maintenance Procedures
   1. Safety precautions
   2. Driveability problem verification techniques
   3. Routine maintenance procedures

VI. Assignments

A. Reading from text and handouts

B. Write Laboratory Journal

VII. Methods of Evaluating Objectives

A. Student Notebooks and Laboratory Journals

B. Objective and written quizzes

C. Objective and final examination

D. Attendance per department policy

VII. Text and Supporting References

Halderman, James D. Diagnosis and Troubleshooting of Automotive Electrical, Electronic, and Computer Systems. 1st ed. Englewood Cliffs, N.J.: Prentice Hall, Inc., 1991.

Duffy, James E. / Smith, Howard B. Automotive Fuel Systems. 1st ed. South Holland, Ill: Goodheart-Wilcox Co., Inc., 1987.

DEGREE APPLIC.

DEANZA COLLEGE
APPLIED SCIENCE DIVISION
COURSE OUTLINE

Automotive Technology X76 Fall 1991

I. Catalog Information

AUTO TECH X76 AUTOMOTIVE AIR CONDITIONING SYSTEMS 3 Units

Prerequisite: Approved Automotive Technology Course Sequence Contract

Seventy two hours lecture-laboratory

Operation and service of the automotive air conditioning, refrigeration and electrical control systems. Emphasis is on diagnosis and repair of these systems.

II. Course Objectives

The student will be able to:

A. Explain and diagnose air conditioning problems

B. Demonstrate the diagnostic procedure for electrical and vacuum system problems

C. Demostrate the procedure for charging and evacuating the air conditioning system

D. List part numbers for component parts of the systems

E. Explain the operation of the refrigeration system

III. Essential Student Materials

A. Basic tool set.

B. Approved work clothing, safety glasses.

IV. Essential College Facilities

Automotive Technology laboratory facilities.

V. Expanded Description: Content and Form

A. Basic refrigeration systems and components
   1. Theory of operation
   2. Compressor

3. Condenser
4. Receiver/drier
5. Expansion valve or tube
6. Evaporator
7. Thermostatic control switch
8. Pressure cycling switch
9. Suction control devices

B. System Servicing
1. System charging
2. Evacuation
3. Leak detection

C. Electrical Control of Compressor and Blower Circuits
1. Diagnostic procedure
2. Different types of control circuits

D. Electrical and Vacuum Controls
1. Vacuum circuitry
2. Diagnosis procedure of vacuum circuits
3. Electrical and electronic controls

E. Diagnosis and Repair Procedures
1. Diagnosis of problems
2. Component repair and replacement

F. Compressor Resealing
Axial compressor

G. Test and Repair Equipment
1. Leak detector
2. Gauge set
3. Electronic testers
4. Specialty wrenches and tools

VI. Assignments

A. Reading from text and handouts

B. Write Laboratory Journal

VII. Methods of Evaluating Objectives

A. Student Notebooks and Laboratory Journals

B. Objective and written quizzes

C. Objective and final examination

D. Performance examination

E. Attendance per department policy

VII. Text and Supporting References

Editorial Staff, Automotive Air Conditioning Service Training Manual. San Diego, Cal: Mitchell Manuals, Inc., 1991

U.S. Department of Labor
Employment and Training Administration
and
U.S. Department of Education
Vocational and Adult Education

Dr. Maria Banatao
DeAnza College
2150 Stevens Creek Blvd.
Cupertino, CA 95014

Dear Dr. Banatao:

Thank you for your testimony at the public hearing on skill standards and certification held in San Francisco on April 28, 1992. We appreciate your interest in this initiative and value your input. We are now in the process of analyzing the results of the hearings as well as the written testimony that has been submitted. A final report should be available by late July. Your name has been placed on the Skill Standards and Certification mailing list to ensure that you will receive a copy of the report and any other materials distributed in relation to this effort.

The Departments of Labor and Education and the National Advisory Commission on Work-Based Learning wholeheartedly concur with your opinion that skills standards and certifications are a key to success for American businesses. It is our belief that investment in human resources will provide the competitive advantage for our industries in the global economy.

The skill standards programs you discussed are very interesting. We strongly support linking education and industry such as the Automotive Technician Internship Program seems to do. This appears to be the type of program that can graduate highly skilled workers capable of performing a variety of tasks. We believe that companies could use existing training programs as models for the development of new training programs. We encourage a collaborative effort among all stakeholders to develop, implement, promote and maintain skill standards and certifications within a national framework.

Again, thank you for engaging in the public dialogue phase of our work in the area of skill standards and certification. I invite your participation in future activities undertaken by the Departments of Labor and Education and the National Advisory Commission in support of national, voluntary, industry-based skill standards and certification.

Sincerely,

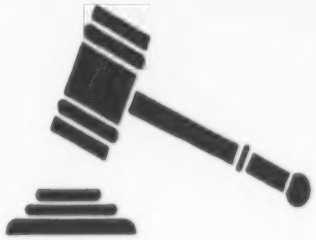
Kent Sharples
Commissioner, National
Advisory Commission on
Work-Based Learning

Automotive Service Association

San Jose Chapter 42

June 1991 **Monthly Newsletter**

President's Corner



I'll keep it short and sweet this month. Enclosed in this month's newsletter is a copy of the current membership in our chapter. Please review it to make sure your name is correct, address, etc.

Also enclosed is a copy of summer school schedules from both DeAnza and Evergreen College.

In the back of the newsletter is a survey to give to your customers. The State needs these back ASAP.

Bill Benak
William Michael Automotive

A.T.I.P. NEWS UPDATE

Important date to remember -

June 19th - 7pm

At the De Anza College Administration building Executive meeting room.

This is a MANDATORY meeting for any new shop planning on participating in the program starting next September, and suggested for anyone who wants to find out more details. This will be our ONLY orientation meeting for this area, so don't miss it!

If you have not already been contacted by Nancy call immediately to reserve your spot. Nancy can be reached at 415/968-2008 most weekdays.

At this point it appears we have about 18 shops ready to participate as sponsors. We have several students ready to interview. We will need 4 or 5 more shops to assure the start of another program, so if you have been thinking about it stop thinking and join us for this fact filled informational meeting.

Please bring your checkbook if you want to be high on the interview list. First in, first interviews is how it works!

Our pilot A.T.I.P is about to complete its first school year and begin a summer of working on-the-job full time. A representative from De Anza will be visiting each shop this summer to assist in coordinating this phase of the program.

Congratulations to all the students and sponsors of the pilot program who are proving that this type of program can work. Your hard work and commitment to the success of the program and its participants is exceptional. You are showing the way of the future!

Treasurers Report

Statement for the fourth quarter will be mailed this week. They are due and payable by November 15th. Any payments postmarked after that date should include a $20 late fee.

ATIP dues have been increased to $120 per month for $88 a month. This $32 increase is to pay the costs to administer the ATIP program. $88 will continue to go towards the student's tool bonus awarded at the end of the three year program.

Thank you for your prompt payments!

Laurie Moore
Larry's AutoWorks
Treasurer

A.T.I.P. News

Welcome to all our new Sponsors an their interns. We have added six new interns and five new sponsors to the program - the class of '94!

The following shops have become sponsors for the class of '94: Circle Star Motors-Santa Cruz, Coyle European - Scott's Valley, Deans's Foreign Car Repair - Mountain View, Fred's Foreign Car Repair - Morgan Hill, Greg Solo's Engine Room - Santa Cruz, Mazda Honda Toyota Car Care Center - Santa Cruz, and Opal Cliffs Auto Center - Santa Cruz.

This brings our total participation in the program to 20 shops and 21 students. We are growing and getting stronger all the time thanks to all the volunteers, sponsors and administrators who have contributed their time and expertise to the program.

Each of the new students has a pilot program student to show them the ropes and get them up to speed faster - a nice advantage for this incoming group courtesy of our "old timers"!!!

The pilot program "old timers" are beginning their second full year of DeAnza Classes after a summer of working fulltime at their sponsors shops.

We have a steadily growing list of potential interns for NEXT September!! That's right., now is the time to start thinking about the class of '95.

If you are not planning to be in business after 1995, you don't need to think about where to get young, intelligent individuals to staff your business. But for the rest of you who are planning to be in business beyond 1995 who need technicians for the future, seriously consider being a sponsor for this next program.

Every Year you wait may be one more year of being stuck with whoever happens to need a job in an industry where there are too few good technicians to go around.

The other advantage of thinking about this program RIGHT NOW is that you can try out a potential student for a few months before paying to sponsor them in the school program. This way if you don't feel t's a good fit, you have an opportunity to interview and try another student before committing to be their sponsor.

This is a good example of how planning ahead is smart(and safer)business. Let me know if you would like to participate in the "Try them on for size" program in the coming months. You will be glad you did

Larry Moore
Larry's AutoWorks
ATIP Program Coordinator.

THE MANIFOLD

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Vol. 29, No. 12
December 1991

Published For The INDEPENDENT AUTO REPAIR TRADE OF THE PUGET SOUND REGION
to promote Professionalism/Pride/Integrity in the industry

Unique Student Training Co-op Flourishes

by Dan Flanagan

A unique and promising student training program to recruit and train prospective auto technicians for participating independent repair shops is flourishing in the San Jose, California area.

This program, developed by the San Jose Automotive Service Association in conjunction with DeAnza College in Cupertino, California, is now in its second year and shows definite promise as a practical answer to the problem of lack of qualified technicians currently being experienced by most independent repair shops.

Known as Automotive Technician Internship Program (ATIP), this is a cooperative industry/educational-system plan whereby selected students commit to a three year internship with a sponsoring independent shop.

Selected students attend a specially designed comprehensive technical/academic training program at the college two days a week. Students then work full time at their sponsoring shop the other three (sometime four) days per week.

In addition to being a specially designed college level technical training course, the training program includes a full academic education. Upon successful completion the intern receives a two year Associate Degree in Automotive Technology. The intern graduates with a well rounded education, has the specific marketable technical skills to be an asset to the shop, and is fully prepared for ASE testing as Master Technician.

Upon graduation the intern, under the terms of the three year contract, will then work in the sponsoring shop full time for a year. At the end of that year and upon completion of the internship, the student receives a bonus of $3,000 in tool credits from the tool company of the sponsor's choice.

Through an intense testing and screening program, only those students determined to have the highest chance of success in the automotive service industry are admitted as interns .Interns are then paired with selected participating shop owners who are concerned with the future of their own businesses and of the industry.

The participating shop owner pays all tuition and connected school expenses for the intern and provides the tool bonus at the end of the internship. While working at the shop the intern is paid according to a predetermined scale.

This internship program is somewhat similar to Ford's ASSET, GM's ASEP, or Toyota's T-TEN programs whereby selected students alternately work at sponsor dealer shops for a specified time and attend special training programs at specific colleges.

These dealer sponsored training programs have traditionally endeared participating students to the sponsoring new car dealership.

By the same token, under this San Jose apprenticeship program, the sponsoring independent shop owner, at the completion of the program, should have a well trained, faithful employee for many years.

Currently there are 21 interns in the San Jose program. The original class of interns at DeAnza College is now in their second year. A second class was just started and the group is already working on a third class.

The San Jose ASC group has prepared a complete and detailed outline to help others establish the Automotive Technician Internship Program in other areas. They are making this information available to the independent repair trade. For information contact Larry Moore, ATIP Pilot Program Coordinator, 1931 Old Middlefield Way, Mountain View, CA 94043. Or call the ATIP hotline (408) 282-2069.

Expect To Win...

It is a funny thing about life; if you refuse to accept anything but the best, you very often get it.

ASA NEWS

California group designs program to combat labor crisis

It's no secret that the automotive service industry is experiencing a severe shortage of qualified technicians. Unless you are one of the fortunate employers who is lucky enough to be in an area where there is an abundance of labor — or unless you've been under a rock for the last few years — you have probably been affected by the labor crisis. The bad news is that the situation is only going to worsen. According to U.S. government studies, 32,000 new technicians are needed each year in the automotive service industry, just to keep up with the current labor demands. This figure does not account for future needs as the number of vehicles on American highways continues to increase.

One ASA chapter group — the San Jose-ASC chapter of California — has seen firsthand how the labor shortage affects business. According to Larry Moore, owner of Larry's AutoWorks in Mountain View, there has been a significant reduction in the number of qualified technicians applying for jobs — not to mention the "job-hopping" that is occurring as desperate shop owners lure employees away from existing jobs. But why is this shortage occurring?

The San Jose chapter did extensive research and concluded that the lack of training and education was the key to this job shortage. Recent studies by the U.S. government's General Accounting Office show that the level of knowledge and skill needed by an automotive technician is in one of the highest categories in the nation. Automotive service employees must have the technical skills also required by computer programers, X-ray technicians and systems analysts, according to the report. Reading, English and math, skills sometimes bypassed by "mechanically-inclined" people, are now very necessary abilities to have in the automotive industry.

Interns will attend class two days a week at De Anza College, studying English, math and reading, in addition to automotive technology.

Seeking an answer to the labor dilemma, the San Jose chapter did still more research — all on a strictly volunteer basis — and decided that a unique program to attract and train talented individuals to work in the industry was the answer. The Automotive Technician Internship Program (ATIP), to be implemented beginning Sept. 18, 1990, at De Anza College, in Cupertino, Calif., is the resulting "tour de force" of the San Jose chapter.

The program is the same in many respects as educational programs established by other groups in the industry. ATIP divides time between college-level classes and training in the work atmosphere, offering a clearly-defined educational program and a timetable for completion. Students will attend college classes two days a week. But rather than focus entirely on automotive skills, the interns' morning classes will center on fundamentals —

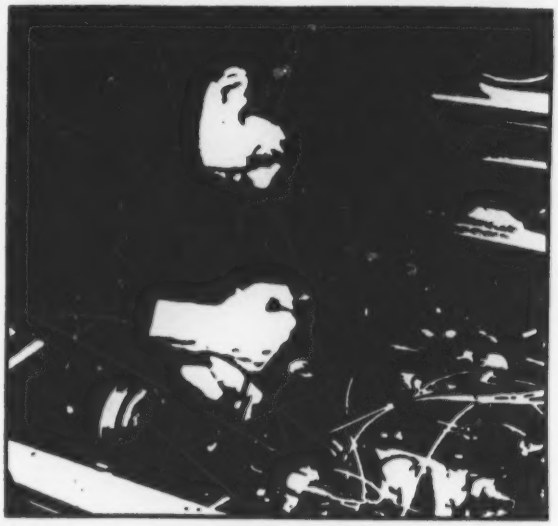
(continued on next page)

ASA NEWS
(continued from page 32)

English, reading and math — while afternoon classes focus on automotive technology training. Acceptance to this program is contingent upon the students demonstrating that they have the basic skills and desire to pursue further education. Qualifying for the program may be tough, but the reward for passing the strict applicant's testing and screening process is a strong educational foundation and substantial financial benefits for the student for completion of the program.

In addition to college courses, interns will spend three days (or four days, in some instances) a week working in the automotive field, obtaining valuable hands-on experience in sponsoring member shops. The first year will be entry-level work for which students receive an initial pay level. After successfully completing the first ATIP training module (with a grade "C" or better), the students will receive a pay raise, and will continue to receive pay raises with subsequent module completions.

Students may work full-time for their employer during summer breaks. The students' third and final year in the program will be spent working full-time for their employers and writing a research paper on the subject of automotive technology.



U.S. government studies say 32,000 new qualified technicians are needed each year in the automotive repair industry.

Upon successfully completing the program, the graduate will have earned an Associate of Arts Degree in Automotive

(continued on next page)

Tired of pulling your hair out finding Volvo parts?

Parts are just part of what Nils Sefeldt offers you.

While many suppliers can offer you parts, most stop short of offering the level of service we are known for.

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ATIP

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Sponsored by
Automotive Service Councils of California
Chapter 42

Computerized Cars Require Computer-wise Automotive Technicians!

This comprehensive training can get you:
- Valuable Job Skills and Experience
- A College Degree
- A Job with Benefits
- A Solid Future in a Growing Industry

Qualifications:
- No Experience Necessary
- High School Diploma or Equivalent
- Be Willing to train on the job 3 days a week
- Attend day classes 2 days per week

For Information Call:

408-864-8772
or
408-864-8527

Student benefits:
- Specially designed coursework to allow completion of degree program in 2 years
- Attend classes 2 days a week
- Earn money 3 days a week (or more)
- On-the-job training at a local shop
- Fully paid tuition
- Discounts on tools
- Guaranteed starting pay
- Scheduled raises
- Full time employment (summers & 3rd year)
- AA Degree in Automotive Technology and A.S.E. Certification as Master Automotive Technician upon program completion
- Bonus of $3,000 in tool credits upon program completion

Student requirements:
- Good driving record
- Meet college entry requirements
- Pay for textbooks and supplies
- Purchase on-the-job tools (limited assistance available if qualified)

Benefits to sponsoring shop:
- Assistance in locating and screening students
- Partnership with school in training
- Predetermined pay plan and work schedule
- Control of on-the-job training
- Well-trained employee at end of program

Requirements of sponsoring shop:
- Pay yearly tuition of $150* for two school years
- Pay normal employee costs
- Monthly deposit to bonus fund of $80*
- Attend all Advisory Committee meetings (no more that 1 per month, no less than 4 per year.

*Estimated approximate costs

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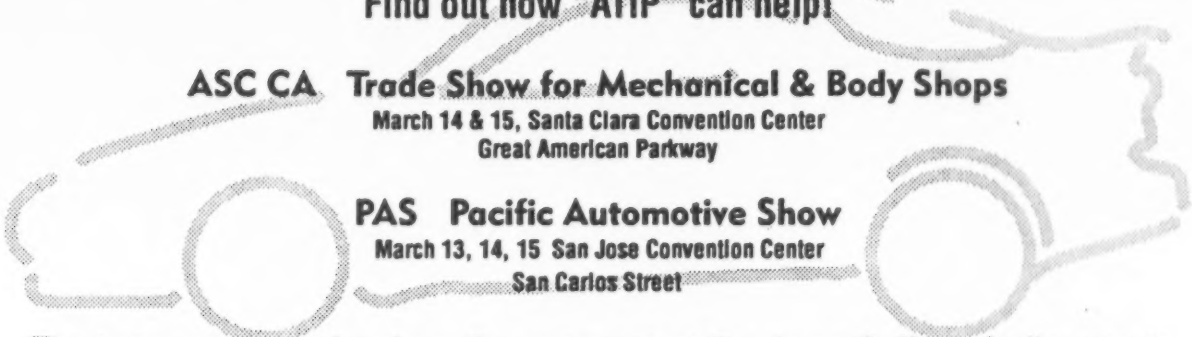
TIRED OF UNTRAINED TECHNICIANS ??

Find out how "ATIP" can help!



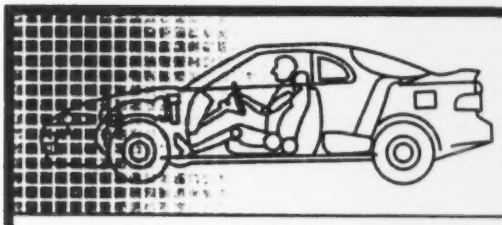
ASC CA Trade Show for Mechanical & Body Shops

March 14 & 15, Santa Clara Convention Center
Great American Parkway

PAS Pacific Automotive Show

March 13, 14, 15 San Jose Convention Center
San Carlos Street

*The **Automotive Technology Department at De Anza College** invites you to stop by our booth for special information about our **ATIP** and Degree programs.*
Leave your business card to win a prize!



Computerized Cars Require Computerwise Automotive Technicians!

Announcing Automotive Technician Internship Program

This comprehensive training can get you:

1) Valuable Job Skills and Experience
2) A College Degree
3) A Job with Benefits
4) A Solid Future in a Growing Industry

Qualifications:

- no experience necessary
- high school diploma or equivalent
- be willing to train on-the-job 3 days a week
- attend day classes 2 days per week

For information call:

408/282-2069

AUTOMOTIVE SERVICE COUNCILS OF CALIFORNIA

Sponsored by San Jose Chapter 42.
Participating shops are equal opportunity employers.

Student benefits:

- Specially designed coursework to allow completion of degree program in 2 years
- Attend classes 2 days a week
- Earn money 3 days a week (or more)
- On-the-job training at local shop
- Fully paid tuition
- Discounts on tools
- Guaranteed starting pay
- Scheduled raises
- Full time employment (summers & 3rd year)
- AA Degree in Automotive Technology and A.S.E. Certification as Master Automotive Technician upon program completion
- Bonus of $3,000 in tool credits upon program completion

Student requirements:

- Good driving record
- Meet college entry requirements
- Pay for school books and supplies
- Purchase on-the-job tools

(assistance for above expenses available on limited basis)

Sponsoring shop benefits:

- Assistance in locating and screening students
- Partnership with school in training
- Predetermined pay plan and work schedule
- Control of on-the-job training
- Well trained employee at end of program

Sponsoring shop requirements:

- Pay yearly tuition of $150* for two school years
- Pay normal employee costs
- Monthly deposit to bonus fund of $80*
- Attend all advisory committee meetings-no more than 1 per month or less than 4 per year.

*estimated approximate cost